

Agriculture Sector and Human Development: An Indian Perspective

K. Harika

*Asst. Professor, Department of Economics
AdikaviNannaya University, MSN Campus, Kakinada-533005.*

Abstract

Human development is viewed as the ultimate and long term goal of a growing economy. It has been described as a regular process and an integral part as well as outcome of economic growth. According to theory of economic development, there is a direct relationship between sectorial growth and development in human resources. The present paper examined the theoretical relationship using empirical data between agriculture growth and human development in Indian perspective. This paper evaluates the growth of agriculture and allied sectors and its contribution to human development by adopting a regression analysis considering Human Development (aggregate of per capita GDP, Gross Enrolment and Life Expectancy) as dependent variable and share of agriculture and allied sectors in of gross domestic product is independent variable. The time period for this study is span of 15 years taken from 1970-71 to 2017-18 and the data obtained from World Bank database. The results of the study found that if we consider gross value added to GDP as independent variable, the growth in gross value added to GDP has positive impact on all human development indicators during the study period and it statistically significant. The estimated regression results reveal that the growth in agriculture gross value added to GDP has positive and significantly effects the growth of human development indicators. As whole, there is 1 percent increase in growth in gross value added to GDP attained by 4.37 percent in human development.

Keywords: Agriculture Growth, Human Development and Regression Analysis

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I. INTRODUCTION:

Agricultural development is important for raising the incomes of population dependent on agriculture and growth of non-agricultural sector. There are significant linkages between farm and non-farm sectors. In contrast to this view, it is emphasized that agricultural development is essential for improving industrial and service sectors (Dev, 2018). Agricultural productivity is believed to be enhanced by the incorporation of strategic entrepreneurship skills. In addition to that, an increase in agricultural productivity can successfully promote human development (Mujuru, 2014). The two-way link between Agriculture growth and human development (HD) has been rigorously established in the literature. There is positive correlation agriculture and economic growth over time and across countries. Particular attention is need to improvements in agricultural for human capital. Similarly, agricultural development also requires the growth of human capital at a fundamental level (Huffman & Orazem, 2004; Saksena, & Deb, 2017).

Real growth in Agriculture & allied sector was lower in 2018-19 at 2.9 per cent, after two years of good agriculture growth. As per the 3rd advance estimates released by Ministry of Agriculture & Farmers Welfare, the total production of food grains during 2018-19 is estimated at 283.4 million tonnes, as compared to 285 million in 2017-18 (final estimates). There is a decline of the nominal growth rate of GVA in agriculture from 7.0 per cent in 2017-18 to 4.0 per cent in 2018-19. Share of agriculture sector in total GVA has been consistently falling and now stands at 16.1 per cent in 2018-19 (GoI, 2019). India's HDI (Human Development Index) has improved over the years between 1990 and 2017. The country's HDI value increased from 0.427 to 0.640 but its position still lowest among its peer counties. As per UNDP human development Index, India is ranked 130 among 189 counties (UNDP, 2017). It implies that growth in Agriculture & allied sector is depressing while Human Development Index is improving over a period. In view of the above, the present study makes an attempt to evaluate the agriculture growth and human development in Indian perspective.

II. METHODOLOGY:

The present paper examined the theoretical relationship using empirical data between agriculture growth and human development by undertaking a regression analysis. Human Development Indicators as dependent variables and share of agriculture in GDP and gross value added to GDP of agriculture are independent variables. The time period considered for this study is a span of 48 years from 1970-71 to 2017-18. Human Development Indicators namely Primary School Enrollment, (% gross), Secondary School Enrollment, (% gross), Tertiary School Enrollment, (% gross), Total Enrollment (%Gross), GDP Per Capita (constant 2010 US\$) and Life Expectancy at birth, total (years) are taken to calculate Human Development. Human Development Indicator is average of a country's achievements in life expectancy, education (literacy and gross enrollment) and GDP Per Capita (Beck & Webb, 2003). In the present study human development was proxied by main three components (Life Expectancy, Gross Enrollment, and GDP Per Capita) which are used UNDP human development indexes. The data on Life Expectancy, Gross Enrollment, and GDP Per Capita are obtained from World Bank indicators. Agriculture sector is considered as independent variable and proxied by value added to GDP (constant 2010 US\$) and share of GDP. The data on agriculture sector obtained from World Bank database. With the above variables, we have constructed a Linear regression model in order to verify the relative influence of growth of agriculture on human development in the Indian context. We expect the coefficient of growth of agriculture to bear a positive sign, which would mean that the higher level of agriculture growth, the higher would be Human development. The regression model is designed to estimate linear relationships between variables based on earlier studies (Ranis et al, 2000; Ghosh, 2006; Atmakuri et al, 2014; Reddy et al, 2019). The form of the linear model is:

$$\ln Y = \alpha + \beta_1 \ln x_1 + \dots + \mu \dots \dots \dots \text{(equation-1)}$$

$$\ln Y = \alpha + \beta_2 \ln x_2 + \dots + \mu \dots \dots \dots \text{(equation-2)}$$

Where

- y = Human Development Indicator
- x₁ = Agriculture and allied, value added (% of GDP)
- x₂ = Agriculture and allied, value added (constant 2010 US\$)
- α = Intercept of the model
- β = Coefficient to the estimated
- μ = Error term of the regression equation

III. RESULTS AND DISCUSSION:

Table 1 displays summary statistics for the selected indicators during 1970-71 to 2017-18. The average agriculture share in GDP is 25.13 percent and it is censored between 14.602 percent and 41.162 percent. The mean value of gross value added to GDP has found 19892.81 Lakh US dollars with standard deviation of 8050.14. In enrollment, the highest mean value has found for primary schooling is 95.28 percent followed by secondary schooling is 45.33 percent and tertiary schooling is 10.25 percent. In case of enrollment, the average enrollment is 50.38 percent and it is between maximum of 72.15 percent and minimum of 4.80 percent. The average life expectancy is 59.83 years and it is censored between the highest is 69.433 years and the lowest is 48.40 year. The aggregate GDP per capita during the study period is 843.790 US dollars and the standard deviation of GDP per capita is 480.754 US dollars for annum. The distribution of the data has observed positive Skewness in all components of human development indicators excluding life expectancy.

Table -1: Descriptive Statistics of Selected Indicators during 1970-71 to 2017-18								
Statistics	Agriculture and allied, value added (% of GDP)	Agriculture and allied, value added (constant 2010 US\$)	School enrollment, primary (% gross)	School enrollment, secondary (% gross)	School enrollment, tertiary (% gross)	Total Enrollment (%Gross)	GDP per capita (constant 2010 US\$)	Life expectancy at birth, total (years)
N	48	48	48	48	48	48	48	48
Mean	25.137	19892.81	95.284	45.327	10.522	50.378	843.790	59.834
Std. Deviation	7.369	8050.14	11.247	15.777	7.557	11.219	480.754	6.179
Variance	54.308	64804675	126.504	248.924	57.104	125.873	231123.9	38.177
Skewness	0.313	0.56	0.324	0.477	1.336	0.593	1.113	-0.123
Minimum	14.602	9435.90	78.514	23.840	4.804	35.760	381.540	48.398
Maximum	41.162	37503.33	114.538	75.092	28.061	72.153	2100.801	69.433

Source: Database, World Development Indicators, World Bank..

Table 2 displays the growth (Exponential) for the regression variables during 1970-71 to 2017-18. The growth of all Human development indicators have found positive trend and statistically significant during study period. The per capita GDP has growing 3.7 per cent per year, Enrollment and Life Expectancy have improving 1.50 per cent and 0.07 per cent. The growth of Agriculture and allied, value added (% of GDP) is showing negative trend and significant while Agriculture and allied, value added is showing positive trend during 1970-71 to 2017-18. The lowest Coefficient of Variation has observed on life expectancy (10.34) and it implies that more consistent growth followed by enrollment (22.27) and GDP per capita (56.97) is the highest and witnessed inconsistent growth. Among the all human development indicators, tertiary school enrollment has found the highest Coefficient of Variation that is 71.88 while the lowest Coefficient of Variation has found for life expectancy that is 10.34.

Table-2: Growth Rates of Selected Indicators during 1970-71 to 2017-18				
Selected Indicators	Mean	Std. Deviation	CV	GR
Agriculture and allied, value added (constant 2010 US\$)	19892.81	8050.14	40.47	2.9 (0.000)
Agriculture and allied, value added (% of GDP)	25.137	7.369	29.317	-2.10 (0.000)
School enrollment, primary (% gross)	95.284	11.247	11.804	0.08 (0.000)
School enrollment, secondary (% gross)	45.327	15.777	34.808	2.50 (0.000)
School enrollment, tertiary (% gross)	10.522	7.557	71.817	4.0 (0.000)
Enrollment (%Gross)	50.378	11.219	22.270	1.50 (0.000)
GDP per capita (constant 2010 US\$)	843.790	480.754	56.975	3.7 (0.000)
Life expectancy at birth, total (years)	59.834	6.179	10.326	0.07 (0.000)
Human Development (Aggregate of Enrollment GDP per capita & Life expectancy)	318.00	165.77	52.13	3.30 (0.000)

Source: Database, World Development Indicators, World Bank.
CV= Coefficient of Variation & GR= Growth Rate (Exponential)

Figure -1: Growth of Selected Indicators during 1970-71 to 2017-18

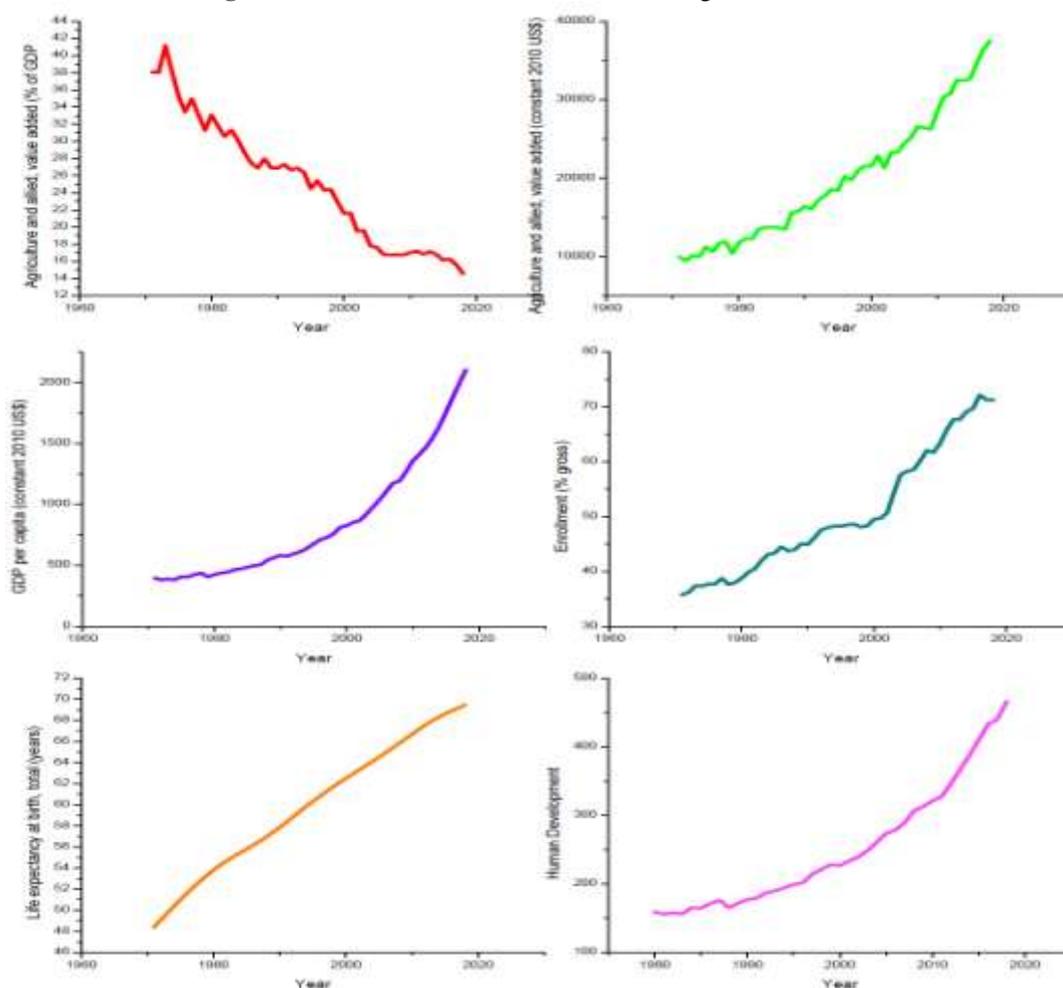


Table 3 displays the results of regression analysis for growth of agriculture sector impact on Human Development. The table shows that more than 0.90 percent of variation in the dependent variable is explained by independent variable the all cases when we consider the share of agriculture sector in GDP as independent variable. The growth in agriculture share in GDP has negative impact on all human development indicators during the study period and it statistically significant. The values of R^2 for this model indicate that model is succeeded explaining more than 0.90 percent variation in dependent variable. Highly significant 'F' values specify that variable included in the model have significant influence on dependent variable and model is fitted as best (equation-1).

The regression results also exhibited that more than 0.90 percent of variation in the dependent variable is explained by independent variable the all cases when we consider gross value added to GDP as independent variable. The growth in gross value added to GDP has positive impact on all human development indicators during the study period and it statistically significant. The estimated results reveal that the growth in agriculture gross value added to GDP has positive and significantly effects the growth of human development indicators. There is 1 percent increase in growth in gross value added to GDP affected by 0.52 percent growth in enrollment, 0.25 percent growth in life expectancy and 1.26 percent in GDP per capita. As whole, there is 1 percent increase in growth in gross value added to GDP attained by 4.37 percent in human development. The values of R^2 for this model indicate that model is succeeded explaining more than 0.90 percent variation in dependent variable. Highly significant 'F' values specify that variable included in the model have significant influence on dependent variable and model is fitted as best (equation-2).

Table-3: Agriculture Growth and Human Development – Regression Results								
Independent Variables	Agriculture and allied, value added (% of GDP)				Agriculture and allied, value added (constant 2010 US\$)			
	α	β	R ²	F	α	β	R ²	F
School enrollment, primary (% gross)	5.763 (0.000)	-0.381 (0.000)	0.945	795.6 (0.000)	1.850 (0.000)	0.275 (0.000)	0.984	513.9 (0.000)
School enrollment, secondary (% gross)	7.380 (0.000)	-1.140 (0.000)	0.930	641.5 (0.000)	-4.602 (0.000)	0.851 (0.000)	0.968	1409.9 (0.000)
School enrollment, tertiary (% gross)	8.052 (0.000)	-1.858 (0.000)	0.833	229.7 (0.000)	-11.274 (0.000)	1.367 (0.000)	0.864	252.0 (0.000)
Enrollment (% Gross)	6.139 (0.000)	-0.705 (0.000)	0.945	791.4 (0.000)	-1.221 (0.000)	0.521 (0.000)	0.964	1233.8 (0.000)
GDP per capita (constant 2010 US\$)	12.000 (0.000)	-1.698 (0.000)	0.938	692.7 (0.000)	-5.800 (0.000)	1.263 (0.000)	0.968	1387.3 (0.000)
Life expectancy at birth, total (years)	5.180 (0.000)	-0.334 (0.000)	0.958	1040.6 (0.000)	1.591 (0.000)	0.254 (0.000)	0.977	1931.8 (0.000)
Human Development	10.577 (0.000)	-1.550 (0.000)	0.936	670.6 (0.000)	-12.231 (0.000)	4.375 (0.000)	0.920	528.5 (0.000)

Source: Database, World Development Indicators, World Bank.
Note: Figures in parentheses are p-values.

IV. CONCLUSION:

The results of the study found that the growth of all Human development indicators have found positive trend and statistically significant during study period. The growth in share of agriculture in GDP is showing negative trend and significant while agriculture value added to GDP is showing positive trend during 1970-71 to 2017-18. When the study consider the share of agriculture sector in GDP as independent variable, The growth in agriculture share in GDP has negative impact on all human development indicators during the study period and it statistically significant. If we consider gross value added to GDP as independent variable, the growth in gross value added to GDP has positive impact on all human development indicators during the study period and it statistically significant. The estimated results reveal that the growth in agriculture gross value added to GDP has positive and significantly effects the growth of human development indicators. As whole, there is 1 percent increase in growth in gross value added to GDP attained by 4.37 percent in human development.

REFERENCES

- [1]. Atmakuri, V. K., Reddy, S. M., & Rao, D. V. (2014). Economic Growth and Human Development: An Empirical Analysis of Major States of India during the Period 1993–94 to 2004–05. *Economic Affairs*, 59(1), 11-22.
- [2]. Beck, T., & Webb, I. (2003). Economic, demographic, and institutional determinants of life insurance consumption across countries. *The World Bank Economic Review*, 17(1), 51-88.
- [3]. Dev, S. M. (2018). *Transformation of Indian Agriculture? Growth, Inclusiveness and Sustainability* (No. 2018-026). Indira Gandhi Institute of Development Research, Mumbai, India.
- [4]. Ghosh, M. (2006). Economic growth and human development in Indian states. *Economic and Political Weekly*, 41(30), 3321-3329.
- [5]. Government of India (2019). *Economic Survey of India*, Union Ministry for Finance & Corporate Affairs, Government of India, New Delhi.
- [6]. Huffman, W., & Orazem, P. (2004). The role of agriculture and human capital in economic Growth: Farmers, schooling, and health. Working Paper # 04016, *IOWA State University*, Ames.
- [7]. Mujuru, J. T. (2014). Entrepreneurial agriculture for human development: A case study of Dotito Irrigation Scheme, Mt Darwin. *International Journal of Humanities and Social Science*, 4(4), 121-131.
- [8]. Ranis, G., Stewart, F., & Ramirez, A. (2000). Economic growth and human development. *World development*, 28(2), 197-219.

- [9]. Reddy, S. M., & Reddy, V. N. (2019) Social Sector Expenditures and Their Impact on Human Development in India: Empirical Evidence During 2001-02 To 2015-16.*International Journal of Recent Technology and Engineering*,7(6), 1938-1943.
- [10]. Saksena, S., & Deb, M. (2017).Economic Growth and Human Development in Indian States after Two Decades of Economic Reforms1. *Indian Journal of Economics and Development*, 13(2), 269-280.
- [11]. United Nations Development Programme (2017).*Human Development Report 2017*. New York.

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